

DO STATINS MITIGATE THE EFFECTS OF PM₁₀? A CASE-ONLY ANALYSIS ON HOSPITAL ADMISSIONS FROM REGIONAL GOVERNMENT ADMINISTRATIVE DATABASES

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Background and Aims: While particles are associated with hospital admissions for heart disease, there is little evidence about the role of pre-admission medication. Our aim was to investigate how pre-admission cardiovascular treatment modifies the effect of PM₁₀ on hospitalization for cardiovascular diseases.

Methods: We examined cardiovascular hospital admissions (ICD-9-CM 410 – 429) occurred during 2005 in the residents of six cities of Lombardy (Northern Italy), accounting for roughly 500.000 inhabitants. For each inpatient we obtained his/her pre-hospitalization medical prescriptions of cardiovascular drugs. Daily average concentration of PM₁₀ and temperature were provided by the Regional Agency for Environmental Protection of Lombardy. The modification of the effect of PM₁₀ exposure on hospital admissions for cardiovascular diseases due to medical treatment was assessed through a case-only approach. We fitted separate models for statins, antiarrhythmics, and all other cardiovascular drugs, accounting for the simultaneous presence of more than one among the three aforementioned classes of drug, long and short term confounding, heterogeneity among cities and effect of temperature.

Results: During the study, 8,527 hospital admissions with cardiovascular diagnosis occurred to 6,467 subjects. Cardiovascular prescriptions related to patients hospitalized for cardiovascular causes were 52,205. 76.83% of the admitted patients had a pre-hospitalization cardiovascular therapy. The results of case-only analyses showed a significant modification of PM₁₀ effect for all the examined active agents. The strongest effect modification was due to pre-admission treatment with lipid modifying agents (OR treated vs non treated, related to a 10 µg/m³ increment in PM₁₀ concentration: 0.967, 95% CI, 0.945 – 0.989). The trend observed for the whole year was confirmed both in warm and cold season, though the results were not statistically significant after stratification for season.

Conclusions: Our study gives some interesting indications of cardiovascular treatments, and in particular statins, having a protective effect against the negative consequences of exposure to PM₁₀.